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Bioenergy is one of the largest sources of renewable energy today, providing heat, electricity and transportation fuels. It is expected to make up one fifth of the total global energy supply by 2050 (IEA, 2021) and provide significant emissions reductions in a wide range of industries. Policies supporting the production and use of bioenergy

have been steadily increasing in recent years and will play a critical role in ensuring sustainability and addressing barriers to its deployment. Key policies from around the world are described in the following list. Several of these policy instruments are in place or under development in Canada at the federal or provincial and territorial levels.



Global regulatory and economic instruments that support bioenergy










Instrument	Description	Examples
Renewable energy law	A law that sets a target for the share of energy to be supplied from renewable sources, often embedded in technology road maps or national action plans for renewable energy	Renewable Energy Directive (RED II) (EU)  Fit for 55 (EU) 
Quota or mandate	Renewable fuel quotas and mandates or renewable portfolio standards set a minimum level for renewable content in liquid fuels (e.g. gasoline, diesel) or for electricity sold. These mandates have supported the production of liquid biofuels that are used primarily by the transportation sector. They have also supported using solid and gaseous biofuels to generate electricity and heat for industry and buildings.	Clean Fuel Regulations (Canada)  Brazil ethanol blending mandate (Brazil)  Renewable Fuels Standard (US)  National Policy on Biofuels (India) 
Feed-in tariff (FIT)	FIT agreements guarantee electricity suppliers a price per unit of generation over a specified timeline, promoting stable production of renewable energy.	Revised Feed-in-Tariffs for Renewable Energy (Kenya)  FIT policy for biomass generation (Vietnam)  Feed-in-Tariffs (Switzerland) 
Feed-in premium (FIP)	FIPs complement revenues generated on the standard market by paying a premium for the amount of electricity generated or the capacity installed.	Feed-In Premium (Greece)  Contracts for Difference (UK)  Feed-In Premium (Finland) 
Capital grants and subsidies	Grants reduce upfront capital costs and help stimulate research, development and demonstration whereas subsidies provide the certainty of operational income. Both can support small- and large-scale projects, including power, heating, biomass supply chains, and biofuels production	Clean Fuels Fund (Canada)  District Heating Network 4.0 (Germany)  Biofuel Infrastructure & Agriculture Product Market Expansion Program – IRA (US) 
Soft loan and loan guarantee	Loan programs with low interest rates provide access to low-interest financing for developers of eligible projects.	Canada Infrastructure Bank (Canada)  Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program (US) 

Tax incentive or credit	Tax mechanisms reduce the net cost of projects by deferring taxes or refunding investments for eligible equipment, thus allowing investment of the savings into other expenditures. Additionally, reduced levies and duties on bioenergy producers and import tariffs on liquid biofuels help encourage cost-competitiveness and influence consumer behaviour.	Swedish tax exemption on biofuels (Sweden)  Clean Fuel Production Tax Credit – IRA (US)  Clean Technology Investment Tax Credit (Canada)  Clean Electricity Investment Tax Credit (Canada) 
Carbon pricing	These pricing schemes incorporate the cost of negative externalities caused by fossil-fuel greenhouse gas (GHG) emissions via a tax or an emissions trading system. A price on carbon helps make bioenergy more cost-competitive with fossil fuels.	China Emissions Trading Scheme (China)  EU Emissions Trading System (EU)  Output-based Pricing System (Canada) 
Auction scheme or tender	Auctions or tenders are held by a government or public entity to contract a certain amount or capacity of renewable energy. Tenders are best suited to larger scale projects that have high up-front costs and need guarantees.	Renewable energy capacity auction (Spain)  Argentina Renewable Energy Auctions – RenovAr Program (Argentina)  ACT renewable energy reverse auctions (Australia) 
Certification scheme	These schemes provide market certainty about the sustainability of bioenergy and mitigate the risk of adverse impacts. For example, they allow companies and producers to prove that the bioenergy that they are producing, purchasing or consuming meets a specific set of sustainability criteria, especially in tracing the origins of the feedstock. They can be established by governments or the private sector.	International Sustainability & Carbon Certification (ISCC) Sustainable Resources Verification Scheme (SURE) (Germany)  Sustainable Biomass Program 
Long-term strategy, plan, or road map	A long-term strategy for bioenergy development can demonstrate a consistent and forward-looking policy that will increase the confidence of investors and project developers and guide policymakers.	Bioenergy Strategy 2020–2027 (Kenya)  Quebec Green Hydrogen and Bioenergy Strategy (Quebec, Canada)  Biomass Strategy (UK) 

Adapted from *How 2 Guide for Bioenergy: Roadmap Development and Implementation*, International Energy Agency (IEA) and Food and Agriculture Organization of the United Nations (FAO)

Featured examples

Instrument	Examples
 Renewable energy law: Renewable Energy Directive to 2030 (RED II) (EU)	An updated RED was consolidated by the EU in 2018 and sets a target for renewable energy consumption of 32% by 2030. The EU’s RED II requires all biomass to meet sustainability and GHG emission criteria for the solid and liquid biofuels used in power, heating, and transport.
 Quota or mandate: Clean Fuel Regulations (Canada)	Canada’s Clean Fuel Regulations require gasoline and diesel suppliers to gradually reduce the carbon intensity of the fuels they produce and sell for use in Canada. It also establishes a credit market in which low-carbon fuel produced from sustainable biomass will be eligible to generate compliance credits. The CFR approach is performance-based to reduce GHG emissions by incentivizing the adoption of clean technologies and low-carbon fuels.

-  **Feed-in tariff (FIT):** Revised Feed-in-Tariffs for Renewable Energy (Kenya) In 2021, the Kenyan government released the Feed-In-Tariffs Policy on Renewable Energy Resource Generated Electricity (Small-hydro, Biomass and Biogas Feed-in-Tariff Policy for Renewable Energy Resource Generated Electricity). As per this policy, both biomass and biogas power generation plants can receive FIT of US\$0.095 per kilowatt hour for 20 years.
-  **Feed-in premium (FIP):** Feed-in-Premium (Finland) Finland's feed-in-premium scheme offers premiums for electricity produced from renewable sources including biogas, forest chips and wood-based fuels. The sliding premium provides tariffs that are dependent on the market price of electricity for new investments in wood fuel plants and electricity produced from wood chips.
-  **Capital grants and subsidies:** District Heating Network 4.0 (Germany) In 2022, Germany introduced a €2.98-billion scheme to support new and existing green district heating systems based on renewable energy and waste heat. The scheme, which will run until 2028, is expected to support the installation of approximately 681 MW of renewable heat generation capacity per year, reducing GHG emissions by approximately 4 million tonnes of CO₂ per year.
-  **Soft loan and loan guarantee:** Canada Infrastructure Bank (Canada) The Canada Infrastructure Bank (CIB) is a federal Crown corporation with over \$35 billion in funding that supports green and sustainable infrastructure projects in the public interest through impact investments and partnerships between governments and the private sector.
-  **Tax incentive or credit:** Clean Fuel Production Tax Credit – IRA (US) The *Inflation Reduction Act* introduced a new Clean Fuel Production Credit that provides a tax credit for the domestic production of clean transportation fuels (equivalent to US\$0.20/gallon) and sustainable aviation fuels (equivalent to US\$0.35/gallon).
-  **Carbon pricing:** Federal Carbon Pricing Backstop, 2018 (Canada) As a central component of the Pan-Canadian Framework on Clean Growth and Climate Change, the carbon levy on fossil fuels was \$50/tonne of CO₂e in 2022 and will increase by \$15 per year to reach \$170 per tonne of CO₂e in 2030.
-  **Auction scheme or tender:** ACT renewable energy reverse auctions (Australia) The Government of the Australian Capital Territory (ACT) conducts reverse auctions wherein contracted generators receive a fixed price for their renewable electricity as long as the projects meet certain economic and clean energy criteria. Since 2012, five reverse auctions have been conducted, resulting in 840 MW worth of contracts, which enabled the ACT Government to meet its 100% renewable energy by 2020 target.
-  **Certification scheme:** Sustainable Biomass Program The Sustainable Biomass Program (SBP) is an international certification scheme designed to provide assurance that woody biomass (such as wood chips and pellets) is sourced legally and sustainably. There are six SBP standards collectively representing the SBP certification scheme.
-  **Long-term strategy, plan, or road map:** Biomass Strategy (UK) The UK's Biomass Strategy presents a strategic framework for the role of biomass for short-term (2020s), medium-term (by 2035) and long-term (by 2050) net-zero goals. Key principles across these timelines include biomass sustainability criteria, waste hierarchy, life cycle GHG accounting, and biomass with carbon capture utilization.

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